CLAIMS:

1.   A method of defining a surface or a volume in a three-dimensional data set
that contains in particular medical data, having the steps of:

a)   presetting of at least two starting lines (11, 13) lying in a three-dimensional
space, the space being preset by the three-dimensional data set,

5   b)   generation of a surface structure (63) from the starting lines (11, 13) by means
of a Fourier transformation,

c)   generation of a surface (61), and particularly a surface of a volume, from the
surface structure (63).

10   2.   A method as claimed in claim 1, wherein step b) comprises the following
steps:

-          division of each starting line (11, 13) into sections, each starting line (11, 13)
having the same number of sections and the location of each section in the three-dimensional
space being defined by a section point,

15   -   formation of point groups, each point group comprising a section point on
each starting line,

-          Fourier transformation of the section points in each point group,

-          addition of zeroes to the Fourier transformed section points in each point
group (zero padding),

20   -   generation of a surface structure by reverse Fourier transformation of the
Fourier transformed section points and the added zeroes in each point group.

3.   A method as claimed in claim 1, wherein a polygonization, and in particular a
triangulation, of the surface structure is carried out in step c).

25

4.   A method as claimed in claim 1, wherein step a) comprises the following
steps:

-          acquisition of measurements with an examination system, and in particular
with a computer tomograph (1), a magnetic resonance unit or an ultrasound unit,

- reconstruction of a three-dimensional data set from the measurements,

- presetting of at least two starting lines (11, 13) lying in the three-dimensional space, the three-dimensional space being preset by the three-dimensional data set.

5   5.   A method as claimed in claim 1, wherein the at least two starting lines (11, 13) have at least one point of intersection (15) in step a), and step b) comprises the following steps:

- determination of the at least one point of intersection (15),

- division of each starting line (11, 13) into part-lines (21 ... 27) at each point of

10 intersection,

- division of each part-line into sections, each part-line having the same number of sections and the location of each section in the three-dimensional space being defined by a section point,

- formation of point groups, each point group comprising a section point on

15 each part-line.

- Fourier transformation of the section points in each point group,

- addition of zeroes to the Fourier transformed section points in each point group (zero padding),

- generation of a surface structure by reverse Fourier transformation of the

20 Fourier transformed section points and the added zeroes in each point group.

6.   A method as claimed in claim 5, wherein the starting lines are closed.

7.   A method as claimed in claim 1, wherein the starting lines are closed.

25

8.   An examination system, in particular a medical examination system, for carrying out the method as claimed in claim 1, having

- an acquisition unit for acquiring measurements,

- a reconstruction unit for reconstructing a three-dimensional data set from the

30 measurements,

- an image-processing unit (4) for defining a surface (61) or a volume,

- a control unit for controlling the acquisition unit, reconstruction unit and image-processing unit (4) in the following steps:

- acquisition of measurements,

- reconstruction of a three-dimensional data set from the measurements,

- presetting of at least two starting lines (11, 13) lying in a three-dimensional data set, and in particular a medical data set,

- generation of a surface structure (63) from the starting lines (11, 13) by means of a Fourier transformation,

- generation of a surface (61), and particularly a surface of a volume, from the surface structure (63).

9. A computer program for a control unit for controlling an acquisition unit, reconstruction unit and image-processing unit (4) of an examination system for carrying out the method as claimed in claim 1, in the following sequence:

- acquisition of measurements,

- reconstruction of a three-dimensional data set from the measurements,

- presetting of at least two starting lines (11, 13) lying in a three-dimensional, and in particular a medical, data set,

- generation of a surface structure (63) from the starting lines (11, 13) by means of a Fourier transformation,

- generation of a surface (61), and particularly a surface of a volume, from the surface structure (63).